

CLAIMS

What is claimed is:

1. An evaporative emission control and leak detection system for a motor vehicle, the system in fluid communication with emissions from a fuel tank, an engine and a carbon canister, the system comprising:

an integrated valve module connected to the carbon canister and in fluid communication with the atmosphere, and arranged to vent the system when exposed to predetermined high negative and positive pressure conditions, and a predetermined low negative pressure condition, the module including a switch operable to indicate when the system is in a high or low negative pressure condition.

2. The system of claim 1, wherein the integrated valve module further comprises:

a low pressure valve; and

a high pressure valve, wherein the low pressure and the high pressure valves are coupled in parallel to a fluid passage between the carbon canister and the atmosphere.

3. The system of claim 2, wherein the low pressure valve is a one-way valve and is arranged to provide low negative pressure system relief.

4. The system of claim 2, wherein the high pressure valve is a two-way valve arranged to provide high positive and high negative system pressure relief.

5. The system of claim 2, wherein the high pressure valve is further arranged to provide pressure relief for the system during refueling of the fuel tank.

6. The system of claim 2, wherein the module further comprises a chamber in parallel fluid communication with the low pressure valve and the atmosphere, and wherein the switch is positioned within the chamber.

7. The low pressure valve of claim 2, further comprising a biasing member arranged to maintain the low pressure valve in a closed position unless a negative pressure exceeding a predetermined low negative pressure threshold is present in the system.

8. The system of claim 7, wherein the switch comprises a diaphragm member coupled to a biasing member and an electrical connector, the switch arranged to overcome the biasing member and contact the electrical connector upon being exposed to a negative pressure condition sufficient to open the low pressure valve.

9. The system of claim 4, wherein the two-way valve further comprises a high positive pressure relief valve member and a high negative pressure valve member, the valve members being biased to a closed position and arranged to open along a common axis when exposed to a negative pressure condition greater than a predetermined high negative pressure threshold and when exposed to a positive pressure condition greater than a predetermined high negative pressure threshold.

10. The system of claim 9, wherein the high positive and high negative pressure valve members are coupled together and arranged to translate along the common axis to an open position as a combined unit when exposed to a positive pressure system condition greater than the high positive pressure threshold, and the high negative pressure valve member is arranged to open along the common axis as an individual unit independent of the high positive pressure valve member when the system is exposed to a negative pressure condition exceeding the high negative pressure threshold.